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FLOOD INSURANCE STUDY

VILLAGE OF NEW HEMPSTEAD, NEW YORK
ROCKLAND COUNTY

COMPLETED

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REVISED:
DECEMBER 16, 1988

ORIGINAL

Federal Emergency Management Agency

COMMUNITY NUMBER - 361618

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance study purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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FLOOD INSURANCE STUDY
VILLAGE OF NEW HEMPSTEAD, ROCKLAND COUNTY, NEW YORK

1.0 INTRODUCTION

1.1 Purpose of Study

The Village of New Hempstead, New York, became an incorporated entity in 1983; this area was previously mapped on the 1976 Town of Ramapo Flood Insurance Rate Map. This Flood Insurance Study presents information for the Village of New Hempstead, and therefore revises and updates a portion of the previous Town of Ramapo Flood Insurance Study/Flood Insurance Rate Map. This information will be used by the Village of New Hempstead to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP). The information will also be used by local and regional planners to further promote sound land use and floodplain development.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses in this study were prepared by Leonard Jackson Associates during the preparation of the Flood Insurance Study for the Town of Ramapo. The work for that study was completed in May 1986.

1.3 Coordination

In February 1987, the Village of New Hempstead was notified by the Federal Emergency Management Agency (FEMA) of the initiation of a Flood Insurance Study for the community.

On January 6, 1988, a final Consultation and Coordination Officer's (CCO) meeting was held with representatives of FEMA and the village to review the results of the study.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Village of New Hempstead, Rockland County, New York. The area of study is shown on the Vicinity Map (Figure 1).

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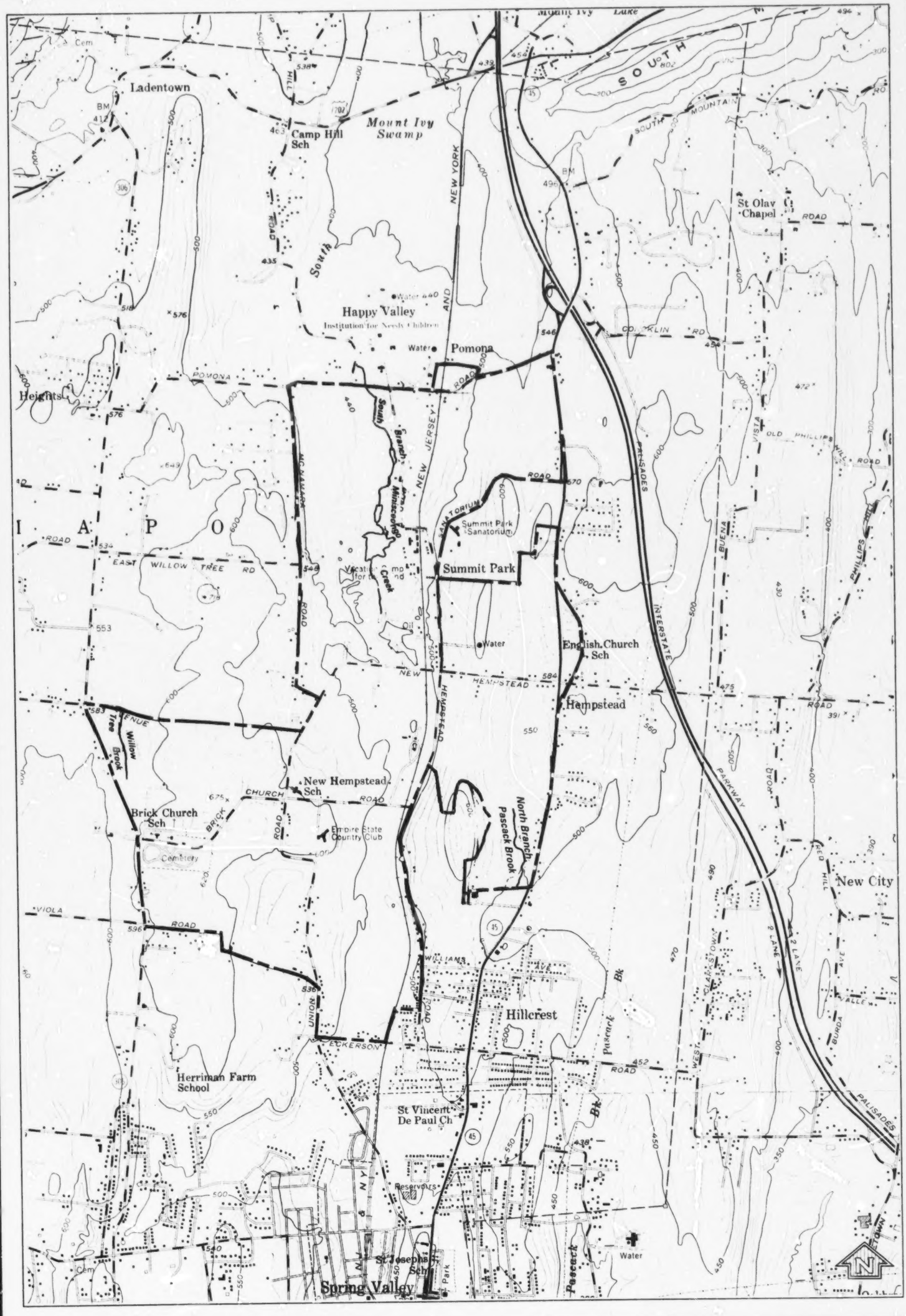

FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF NEW HEMPSTEAD, NY
(ROCKLAND CO.)

APPROXIMATE SCALE
2000 0 2000 4000 6000 FEET

VICINITY MAP

The following streams were studied by detailed methods: North Branch Pascack Brook, from the corporate limits to a point approximately 400 feet upstream of Greenridge Way; and Willow Tree Brook, from the corporate limits to a point approximately 670 feet upstream. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction.

South Branch Minisceongo Creek and an unnamed tributary were studied by approximate methods. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards.

2.2 Community Description

The Village of New Hempstead is located in the western portion of Rockland County, approximately 25 miles north of New York City. It is bordered by the Village of Pomona to the north; the Village of New Square to the east; the Village of Spring Valley to the south; the Village of Wesley Hills to the west; and the Town of Ramapo to the north, south, east, and west. New Hempstead is one of 10 incorporated villages within the Town of Ramapo. In 1984, the population of New Hempstead was approximately 4,039 (Reference 1).

North Branch Pascack Brook flows in a southern direction, with moderate slopes, in the southeast part of the village. Willow Tree Brook flows in a northern direction in the northeast part of the village.

The climate of the region is classified as continental with moderate winters and summers. There are frequent weather changes, particularly during the spring and fall. The temperatures range from an average monthly low of 28 degrees Fahrenheit (^{o}F) in winter to an average monthly high of 69^{o}F in summer. The average annual precipitation is 46 inches, which is uniformly distributed throughout the year. There is an average annual snowfall of 24 inches (Reference 2).

2.3 Principal Flood Problems

Flooding in the community generally occurs during the spring and fall seasons. In the spring, snowmelt adds to heavy rains to produce increased runoff; in the fall, flooding can occur due to hurricane activity.

The most notable floods occurred in November 1973 and April 1984, when record stream discharges were recorded. Flood problems are generally caused by inadequate channel capacities and culvert sizes.

2.4 Flood Protection Measures

There are no known flood protection measures located within the Village of New Hempstead.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the community.

The hydrologic analyses for North Branch Pascack Brook and Willow Tree Brook were obtained from the Flood Insurance Study for the Town of Ramapo (Reference 3). In that study, the hydrologic analyses were determined utilizing the computational method described in Special Report 38 (Reference 4). This method develops peak discharges for selected recurrence intervals based on the parameters of basin size, average channel slope, a surface storage index, and a permeability index. To properly account for future development, permeability indices were selected based upon the assumption of full development within existing zoning regulations.

A summary of the drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges."

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

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TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
NORTH BRANCH PASCACK BROOK					
Approximately 475 feet downstream from Greenridge Way	0.48	190	260	290	370
At Rensseler Drive	0.36	100	140	150	190
WILLOW TREE BROOK					
Approximately 90 feet downstream from Grandview Avenue	0.39	240	320	470	

The hydraulic analyses for North Branch Pascack Brook and Willow Tree Brook were obtained from the Flood Insurance Study for the Town of Ramapo (Reference 3).

Cross sections for the backwater analyses of North Branch Pascack Brook and Willow Tree Brook were obtained from topographic maps at a scale of 1:4,800 with a contour interval of 4 feet, which were derived by aerial photographs at a scale of 1:9,600 (References 5 and 6). The below-water sections were obtained by field measurement. All bridges and culverts were field surveyed to obtain elevation data and structural geometry.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the Flood Insurance Rate Map (Exhibit 2).

Water-surface elevations of floods of the selected recurrence intervals were computed using the COE HEC-2 step-backwater computer program (Reference 7). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals. Starting water-surface elevations for North Branch Pascack Brook were obtained from the Flood Insurance Study for the Town of Clarkstown (Reference 8). For Willow Tree Brook, the starting water-surface elevations were determined using normal depth calculations.

Channel roughness factors (Manning's "n") used in the hydraulic computations for the streams studied by detailed methods were chosen by engineering judgment and based on field observations of the streams and floodplain areas. For North Branch Pascack Brook, the channel "n" values ranged from 0.015 to 0.050, and the overbank "n" values ranged from 0.030 to 0.150. The channel "n" values for Willow Tree Brook ranged from 0.015 to 0.050, and the overbank "n" values ranged from 0.030 to 0.150.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps; the descriptions of the marks are presented in Elevation Reference Marks (Exhibit 3).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For the streams studied in detail, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:4,800 with a contour interval of 4 feet (Reference 5).

For the streams studied by approximate methods, the 100-year flood boundaries were delineated using the previous Flood Insurance Study for the Town of Ramapo (Reference 9).

The 100- and 500-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 500-year floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 100-year floodplain boundary is shown on the Flood Insurance Rate Map (Exhibit 2).

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (Table 2). The computed floodways are shown on the Flood Insurance Rate Map (Exhibit 2). In cases where the floodway and 100-year floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
North Branch Pascack Brook								
A	140	20	44	8.0	498.0	498.0	498.1	0.1
B	820	29	70	5.0	507.1	507.1	507.1	0.0
C	1,630	27	59	5.0	513.5	513.5	513.5	0.0
D	1,910	27	85	3.4	515.2	515.2	515.5	0.3
Willow Tree Brook								
A	410	20	112	3.3	566.6	566.6	567.0	0.4

[1] Feet above corporate limits

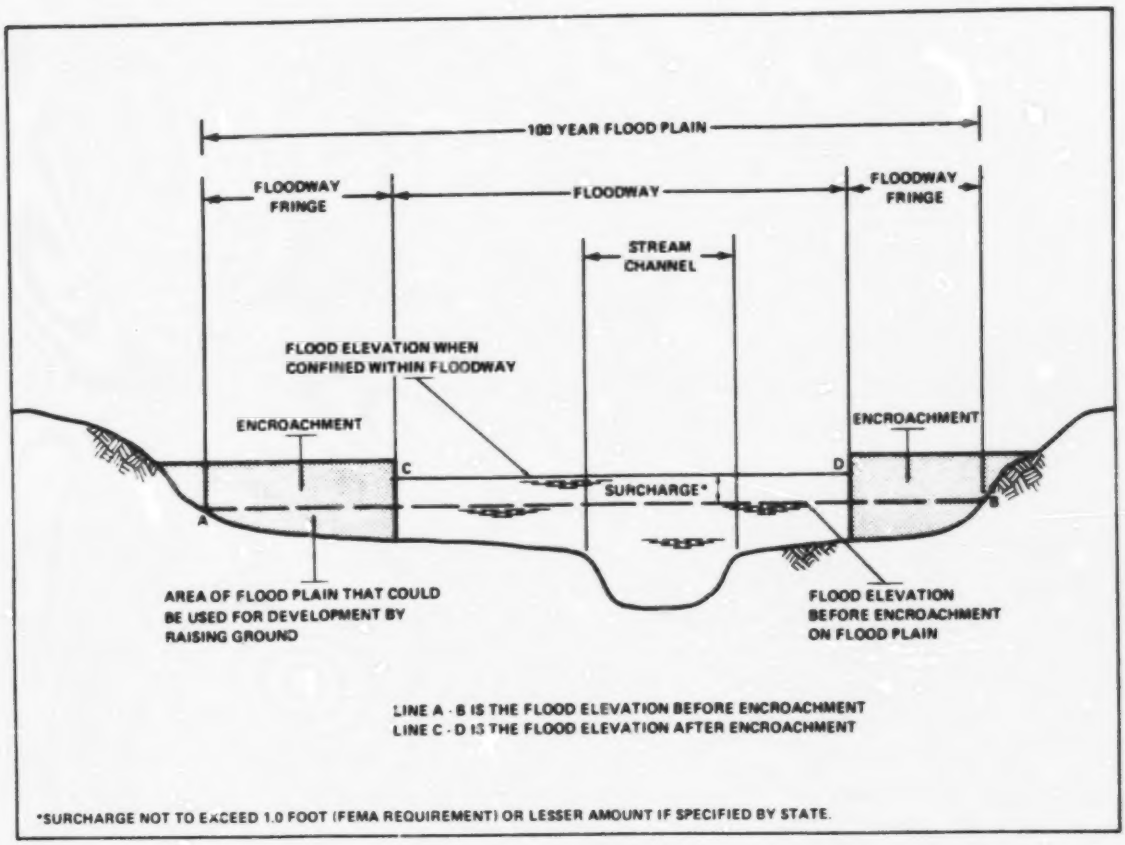
TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF NEW HEMPSTEAD, NY
(ROCKLAND CO.)

FLOODWAY DATA

NORTH BRANCH PASCACK BROOK-WILLOW TREE BROOK


100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A - B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C - D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE.

FLOODWAY SCHEMATIC Figure 2

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

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Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

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Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100- and 500-year floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable.

7.0 OTHER STUDIES

A Flood Insurance Study for the Village of Pomona has been published (Reference 10). The results of this study are in agreement with the results of that study.

Flood Insurance Studies for the Villages of Spring Valley and Wesley Hills, and the Town of Ramapo are currently being prepared (References 11, 12, and 3). The results of those studies will be in agreement with the results of this study.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, the Natural and Technological Hazards Division, 26 Federal Plaza, Room 1351, New York, New York 10278.

9.0 BIBLIOGRAPHY AND REFERENCES

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2. U. S. Department of Commerce, National Oceanic and Atmospheric Administration, Climatography of the United States No. 20, Asheville, North Carolina, National Climatic Center, December 1975.

3. Federal Emergency Management Agency, Flood Insurance Study, Town of Ramapo, Rockland County, New York (Unpublished).

4. State of New Jersey, Department of Environmental Protection, Division of Water Resources, in cooperation with the U. S. Geological Survey, Special Report 38, Magnitude and Frequency of Floods in New Jersey with Effects of Urbanization by Stephen J. Stankowski, Trenton, New Jersey, 1974.

5. Geomaps, Inc., of Mineola, New York, Topographic Maps compiled from aerial photographs, Scale 1:4,800, Contour Interval 4 Feet: Ramapo, New York, March 1984.

6. Geomaps, Inc., of Mineola, New York, Aerial Photographs, Scale 1:9,600: Ramapo, New York, November and December 1983.

7. U. S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Generalized Computer Program, Davis, California, October 1973, updated April 1980.

8. Federal Emergency Management Agency, Flood Insurance Study, Town of Clarkstown, Rockland County, New York, Washington, D. C., March 1, 1984.

9. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Town of Ramapo, Rockland County, New York, Washington, D. C., May 14, 1976.

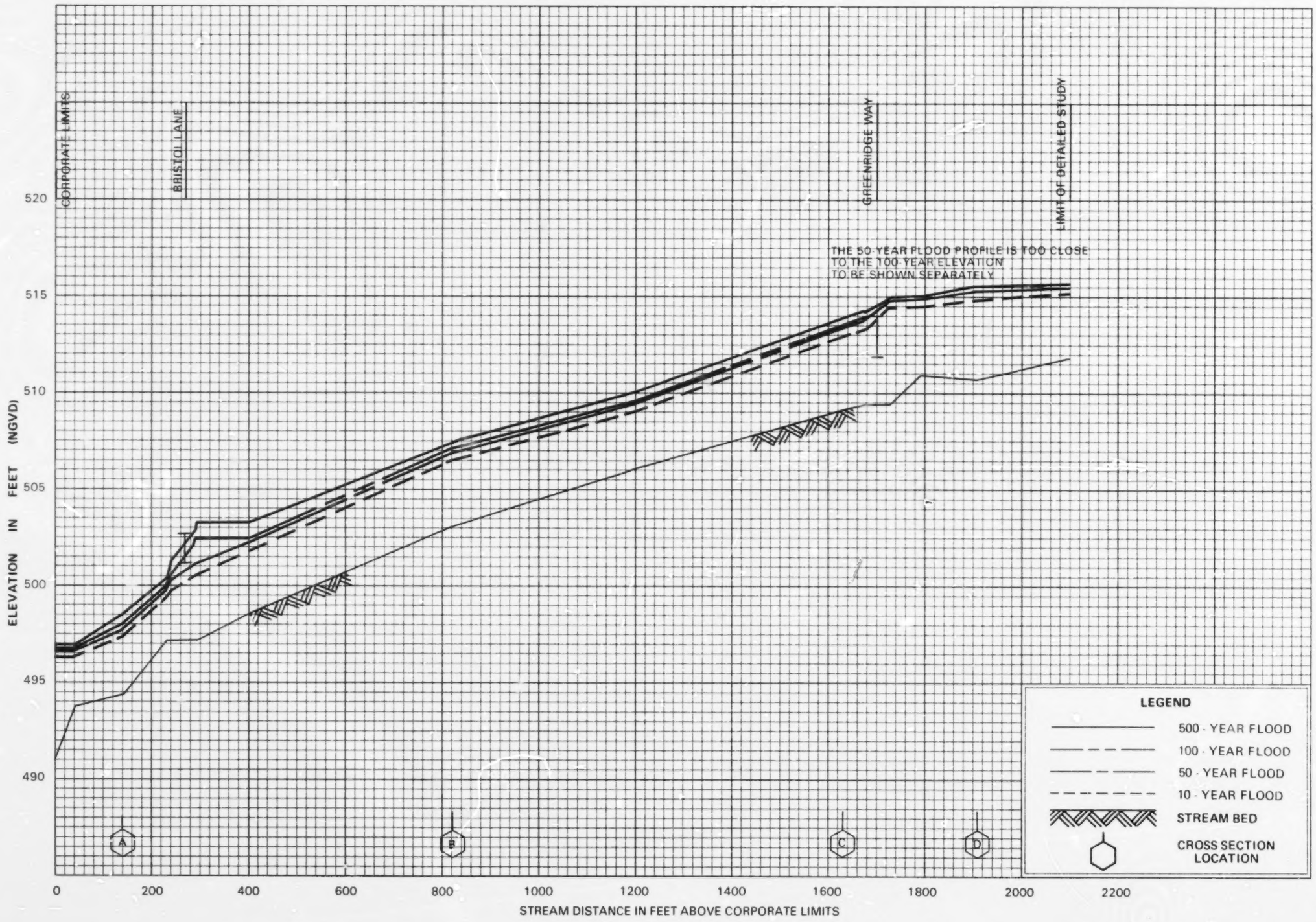
10. Federal Emergency Management Agency, Flood Insurance Study, Village of Pomona, Rockland County, New York, Washington, D. C., April 15, 1982.

11. Federal Emergency Management Agency, Flood Insurance Study, Village of Spring Valley, Rockland County, New York (Unpublished).

12. Federal Emergency Management Agency, Flood Insurance Study, Village of Wesley Hills, Rockland County, New York (Unpublished).

EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 1	02	578.61	Northeast corner of catch basin curb piece at southeast corner of intersection of Skylark Drive and Ridgeway Terrace.
RM 2	02	517.61	Southwest corner of catch basin curb piece on north side of Rensseler Drive at pole No. 58148/41667, 750 feet west of intersection of State Route 45.



FLOOD PROFILES

NORTH BRANCH PASCACK BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF NEW HEMPSTEAD, NY
(ROCKLAND CO.)

01P

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CORPORATE LIMITS
GRANDVIEW AVENUE

LIMIT OF DETAILED STUDY

THE 50-YEAR FLOOD PROFILE IS TOO CLOSE TO THE 100-YEAR ELEVATION TO BE SHOWN SEPARATELY.

ELEVATION IN FEET (NGVD)

580
570
560
550

0 200 400 600 800

STREAM DISTANCE IN FEET ABOVE CORPORATE LIMITS

A

LEGEND

- 500 - YEAR FLOOD
- 100 - YEAR FLOOD
- 50 - YEAR FLOOD
- 10 - YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD PROFILES

WILLOW TREE BROOK

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF NEW HEMPSTEAD, NY
(ROCKLAND CO.)

02P

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